

Simplifying

$\sqrt{\quad}$  = square root

$$\sqrt{25} = 5$$

$$1) \sqrt{600}$$

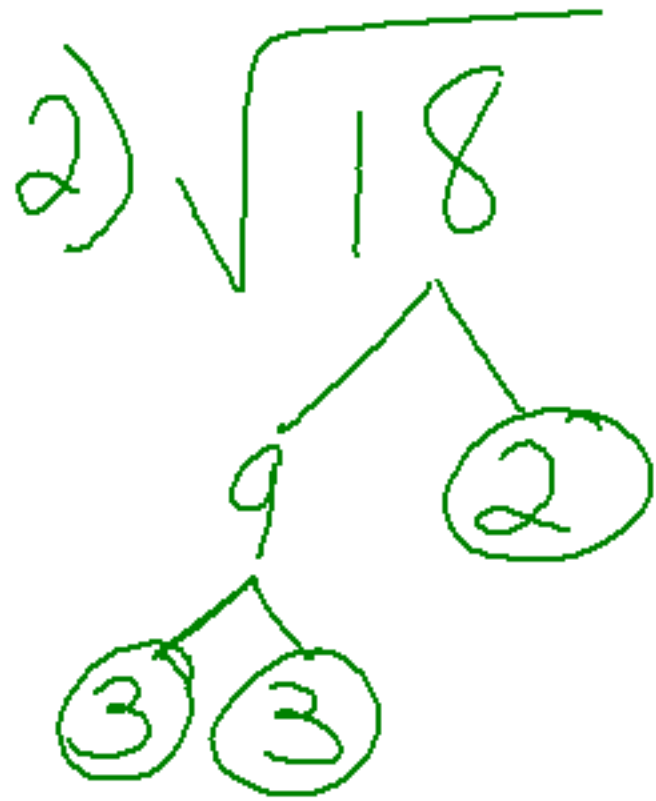
$$= \sqrt{5 \cdot 3 \cdot 2 \cdot 2 \cdot 5 \cdot 2}$$

$$5 \cdot 2 \sqrt{3 \cdot 2}$$

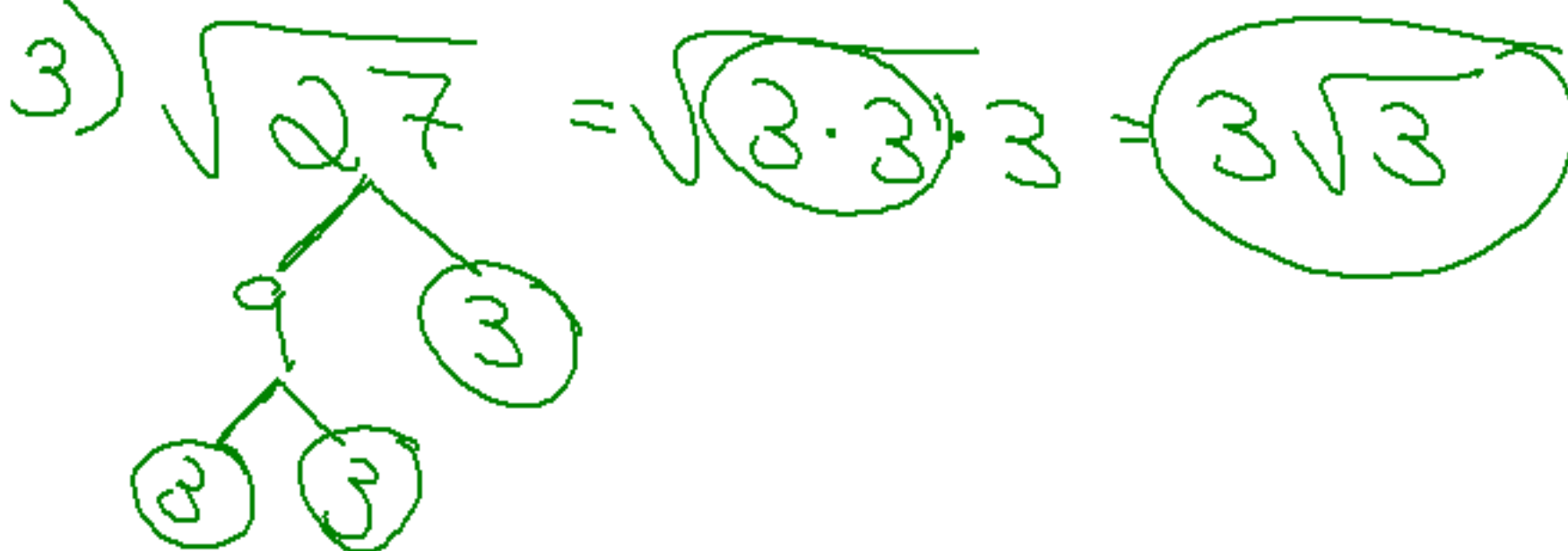
$$10 \sqrt{6}$$



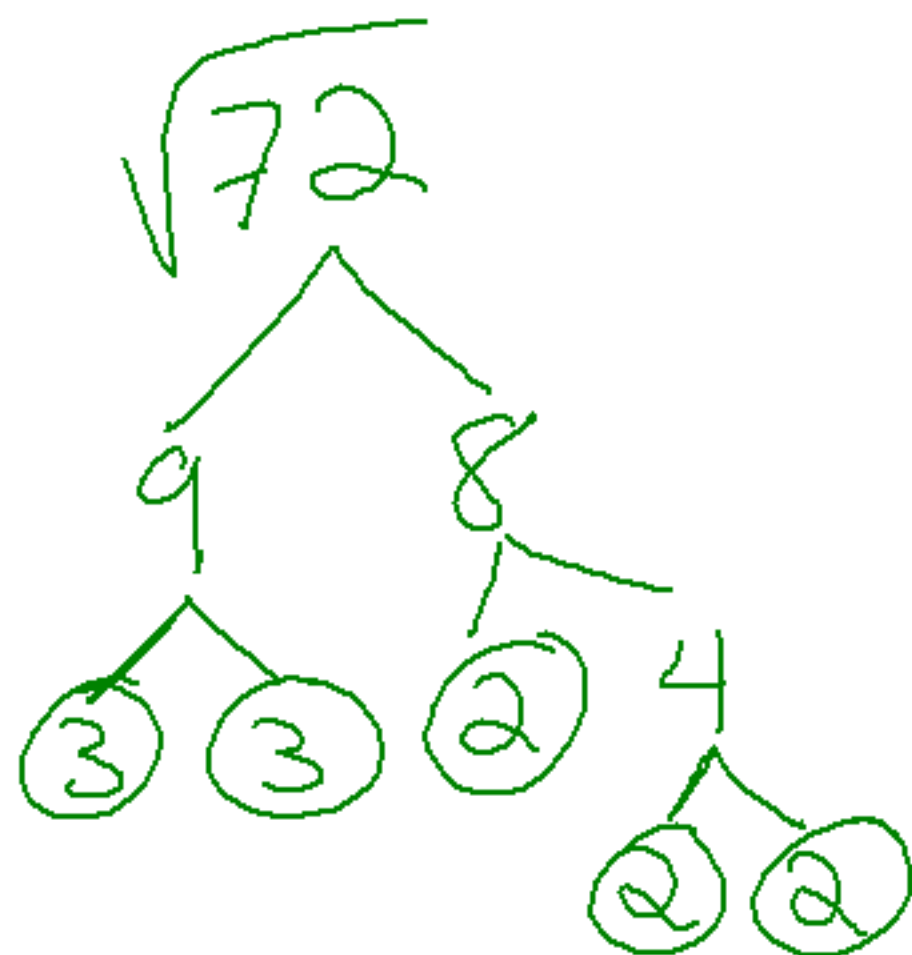
$$\sqrt{2} = 2$$



$$\sqrt{3 \cdot 3 \cdot 2} = \boxed{3\sqrt{2}}$$



$$= \sqrt{3 \cdot 3 \cdot 3} = \boxed{3\sqrt{3}}$$



$$\sqrt{8 \cdot 3 \cdot 2 \cdot 2 \cdot 2}$$

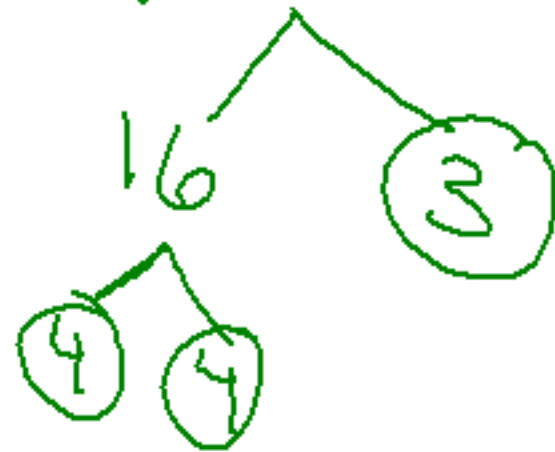
$$3 \cdot 2 \sqrt{2}$$
$$\boxed{6\sqrt{2}}$$

$$5) \sqrt{98} = \boxed{7\sqrt{2}}$$

$$6) \sqrt{315} = \sqrt{5 \cdot 9 \cdot 7} = \boxed{3\sqrt{35}}$$

$$7) \sqrt{45} = \boxed{3\sqrt{5}}$$

$$8) \sqrt{48} = \sqrt{\cancel{16} \cdot 3} = \boxed{4\sqrt{3}}$$



$$\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$1) \sqrt{3} \cdot \sqrt{5} = \sqrt{15}$$

$$2) \sqrt{10} \cdot \sqrt{14} = \sqrt{140}$$

$\begin{matrix} \swarrow & \searrow \\ 5 & 2 \end{matrix} \quad \begin{matrix} \swarrow & \searrow \\ 7 & 2 \end{matrix}$

$$\sqrt{5 \cdot 2 \cdot 7 \cdot 2}$$

$2\sqrt{35}$

$$3) \sqrt{\frac{36}{25}} = \frac{\sqrt{36}}{\sqrt{25}} = \frac{6}{5}$$

$$4) \sqrt{\frac{75}{36}} = \frac{\sqrt{75}}{\sqrt{36}} = \frac{5\sqrt{3}}{6}$$

$$\textcircled{5} \frac{\sqrt{3}}{4} \quad \textcircled{6} \frac{2\sqrt{3}}{3} \quad \textcircled{7} 2\sqrt{49} = 2 \cdot 7 = \textcircled{14}$$

$$\textcircled{8} \sqrt{24} = \boxed{2\sqrt{6}} \quad \textcircled{9} \sqrt{36} = \textcircled{6}$$

$$\textcircled{10} 4\sqrt{63} = \textcircled{12\sqrt{7}}$$

$\swarrow \searrow$   
9    7  
 $\swarrow \searrow$   
3   3

$$\textcircled{11} \frac{\sqrt{45}}{4} = \textcircled{\frac{3\sqrt{5}}{4}}$$

$$\textcircled{12} \frac{\sqrt{48}}{2} = \frac{\cancel{4}\sqrt{3}}{\cancel{2}} = \textcircled{2\sqrt{3}}$$



$$\textcircled{1} \frac{\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6}}{\sqrt{9}} = \boxed{\frac{\sqrt{6}}{3}}$$

$\uparrow$   
 $= \#1$

$$\textcircled{2} \sqrt{\frac{7}{8}} = \frac{\sqrt{7}}{\sqrt{8}} = \frac{\sqrt{7}}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{14}}{2 \cdot \sqrt{4}} = \frac{\sqrt{14}}{2 \cdot 2} = \frac{\sqrt{14}}{4}$$

$$\textcircled{3} \frac{\sqrt{6}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{30}}{5}$$

$$\textcircled{4} \frac{\sqrt{45}}{\sqrt{32}} = \frac{3\sqrt{5}}{4\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{10}}{4 \cdot \sqrt{4}} = \frac{3\sqrt{10}}{4 \cdot 2} = \boxed{\frac{3\sqrt{10}}{8}}$$

$$\textcircled{5} \frac{\sqrt{12}}{\sqrt{18}} = \frac{2\sqrt{3}}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\cancel{2}\sqrt{6}}{\cancel{3}} = \boxed{\frac{\sqrt{6}}{3}}$$

$$\textcircled{6} \frac{\sqrt{4}}{\sqrt{10}} = \frac{\cancel{2}}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{\cancel{2}\sqrt{10}}{\cancel{10}} = \boxed{\frac{\sqrt{10}}{5}}$$

$$\sqrt{\frac{12}{18}} = \sqrt{\frac{2}{3}} = \frac{\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6}}{3}$$

⑦  $\frac{\sqrt{3}}{2}$

⑧  $\frac{\sqrt{10}}{2}$

$$\textcircled{1} \begin{array}{c} \sqrt{2} \quad \sqrt{3} \\ x+y = x+y \end{array}$$

$$\textcircled{2} \begin{array}{l} x+x=2x \\ \sqrt{2}+\sqrt{2}=2\sqrt{2} \end{array}$$

$$\textcircled{3} \begin{array}{l} x+y+x=2x+y \\ \sqrt{2}+\sqrt{3}+\sqrt{2}=2\sqrt{2}+\sqrt{3} \end{array}$$

$$\textcircled{4} 3x+5x=8x$$

$$3\sqrt{2}+5\sqrt{2}=8\sqrt{2}$$

$$\textcircled{5} \sqrt[3]{3} + \sqrt[3]{3} = \textcircled{2\sqrt[3]{3}}$$

$$\textcircled{6} \sqrt{5} + 8\sqrt{5} = \textcircled{9\sqrt{5}}$$

$$\textcircled{7} 6\sqrt{7} - 8\sqrt{7} = \textcircled{-2\sqrt{7}}$$

$$\textcircled{8} \sqrt{2} + \sqrt{3} = \textcircled{\sqrt{2} + \sqrt{3}}$$

9)  $\sqrt{5} - \sqrt{6} = \boxed{\sqrt{5} - \sqrt{6}}$

10)  $6\sqrt{11}$

11)  $-2\sqrt{8}$

12)  $4 + \sqrt{12}$

conjugate = opposite (sign) of  $\sqrt{\quad}$

$$\boxed{5 - \sqrt{6}}$$

conj:  $5 + \sqrt{6}$

$$8 + \sqrt{5}$$

$$8 - \sqrt{5}$$

rationalizing  $\sqrt{\quad}$  in denom.

$$\textcircled{1} \quad \frac{8(4+\sqrt{3})}{(4-\sqrt{3})(4+\sqrt{3})}$$

$$\frac{32 + 8\sqrt{3}}{16 + \cancel{4\sqrt{3}} - \cancel{4\sqrt{3}} - \sqrt{3 \cdot 3} - 3}$$

$$\boxed{\frac{32 + 8\sqrt{3}}{13}}$$



$$\textcircled{2} \frac{(7-\sqrt{3})}{(5+\sqrt{2})} \cdot \frac{(5-\sqrt{2})}{(5-\sqrt{2})}$$

# 5-10

$$\frac{35 - 7\sqrt{2} - 5\sqrt{3} + \sqrt{3} \cdot 2}{25 - 5\sqrt{2} + 5\sqrt{2} - \sqrt{2} \cdot 2}$$

$$\frac{35 - 7\sqrt{2} - 5\sqrt{3} + \sqrt{6}}{25 - 5\sqrt{2} + 5\sqrt{2} - \sqrt{2} \cdot 2}$$

$$\frac{35 - 7\sqrt{2} - 5\sqrt{3} + \sqrt{6}}{23}$$